The combined effects of scarcity and guilt on product evaluation

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Abstract

The current research investigated whether feeling guilty about taking the last of a shared hedonic product increases or decreases the attractiveness and liking of the product. Furthermore, it was examined whether participants' social orientation value moderated the effects of guilt and scarcity on product evaluation. 222 participants filled in the Social Value Orientation Measure and afterwards tasted and evaluated two different colours of gumdrops in one of three conditions. In the scarcity conditions, one colour decreased from six to one, while both colours were abundant in the control condition. In the social scarcity condition, another participant was present, so participants had to share their food. In the social condition, guilt reduced attractiveness and pleasurableness of the product, while in the non-social scarcity condition, participants evaluated the product more positively than the control group. Competition enhanced attractiveness for pro-self individuals, but this effect reversed for pro-social individuals.

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Introduction

Imagine that you are at a birthday party with your friends, sharing cupcakes. When everyone has had one, there's one cupcake left on the plate. You are quite full, however, you are still tempted to eat the last one. What is causing this strong temptation? An explanation for this increased desire for a last resource could be the effect of scarcity (Brock & Brannon, 1992). According to commodity theory (Brock & Brannon, 1992), the more unavailable a commodity is, the more valuable it is perceived. Commodities can be real objects, messages, traits, skills and experiences, that can be possessed and conveyed from person to person. Value is defined as the perceived utility and perceived desirability of the commodity. Therefore, that last cupcake seems more desirable because it is scarce.

However, scarcity is not the only concept that influences how the last piece of pie is perceived. When you eat the last piece, you might experience guilt because there is nothing left for the others. Feeling guilty might influence the pleasurableness of eating the cupcake. Is

guilt so overpowering that you do not enjoy the cupcake at all? Or do you experience this treat as a guilty pleasure? In this thesis I will examine effects of guilt and scarcity on the value of a commodity, specifically, a hedonic good.

Scarcity and attractiveness

We have already discussed that the unavailability of a commodity (scarcity) can increase its value (Brock & Brannon, 1992). Moreover, scarcity can be induced in several ways. Brock (1968, as described by Lynn, 1991) describes four sources of unavailability: a low supply or few suppliers of the commodity, a limited time to obtain the commodity, a greater effort to obtain and keep the commodity, and constraint of possessing a commodity and delays in obtaining a commodity.

Some of these methods for inducing scarcity are more effective than others. For example, Aggarwal, Jun, and Huh (2011) found that scarcity messages about limited quantity were more effective than those about limited time. Two reasons are given for this result. Firstly, limited quantity promotions provide the consumer with a greater sense of uniqueness, in contrast to limited time promotions. For example, a limited edition product one buys cannot be bought by another consumer, whereas a product which is on sale for just one day can be bought by many people, even after the sale ends. Secondly, limited quantity promotions trigger the sense of competition for the commodity, which is an important moderator of the scarcity effect, as shown in a study by Worchel, Lee, and Adewole (1975). Therefore, this research will be conducted in a limited quantity scarcity setting.

In the study by Worchel et al. (1975), scarcity was induced by manipulating the number of cookies in a jar. There were three important findings. First, they found evidence to support the commodity theory: subjects rated a cookie from a jar with two cookies as more attractive, desirable and costly than a cookie from a jar with ten cookies. Furthermore, when an abundant cookie supply was reduced, the remaining cookies were highly valued compared to when the cookies were constantly scarce. Lastly, when the reason the experimenters gave for reducing the supply was that participants had eaten more than expected (social demand) rather than that they had accidentally given the wrong jar, the cookies were more desirable. This last result proves that there is a moderating effect of competition on the scarcity effect.

After the first demonstration of the effects of scarcity on value by Worchel et al. (1975), many researches have searched for explanations. One of the proposed underlying mechanisms is one's need for uniqueness, a theory developed by Snyder and Fromkin (1980, as described by Snyder, 1992). According to this theory, people are motivated to differentiate

themselves from others, and scarce products can be used as a means to show their uniqueness. This mechanism comes forward when consumers are in a social setting: the perceived competition could trigger this need for uniqueness, since more people will not be able to obtain the product than people who will. This in turn enhances the attractiveness of the commodity.

Another prevailing theory explaining the scarcity effect is psychological reactance (Brehm, 1966, as described by Ariga & Inoue, 2015). This theory holds that people experience negative affect when they believe that freedom is 'taken away' from them, and that this emotional state motivates them to recover their freedom: reactance. Therefore, when scarcity is perceived as a loss of freedom, for example when an online promotion has a short duration, leaving consumers with less time to think about their options, people are more attracted to the commodity. This could be an explanation when consumers experience scarcity in a non-social setting: the perceived loss of freedom of choice leads to reactance, which enhances the desirability of the commodity.

Ariga and Inoue (2015) indeed found that when people are by themselves, only a decrease of a commodity induces the scarcity effect, not fewness. Specifically, when participants were presented with a jar with 1 black cookie and 9 white cookies, which was replaced by a jar with 1 black and 4 white cookies, the scarcity effect occurred for the white cookies, although there were fewer black cookies. An explanation could be that people perceived the decrease of white cookies as a loss of freedom, causing reactance. Furthermore, in their third study Ariga and Inoue (2015) found that fewness of a commodity does trigger the scarcity effect when there was someone else present. Specifically, when participants were presented with a jar with 4 white cookies and 1 black cookie, no difference in attractiveness of the cookies was found. However, when the participant was in the presence of someone else who presumably had the same goal, the black cookie was found to be more attractive than the white cookies. This shows that the need-for-uniqueness theory can explain the scarcity effect when consumers experience competition. This result was in line with the study by Worchel et al. (1975), who also found an effect of fewness-based scarcity on value when there was someone else with the same goal present. The studies by Worchel et al. (1975) and Ariga and Inoue (2015) emphasize that competition is an important factor in the relationship between scarcity and value. In this research, scarcity effects are investigated in a social and in a non-social condition.

In summary, unavailability of a commodity (scarcity) enhances its value, or in other words, its perceived desirability and utility (Brock & Brannon, 1992; Worchel et al., 1975). It

seems that psychological reactance explains the scarcity effect when a commodity has recently decreased, while need-for-uniqueness explains the effect when a commodity is constantly scarce, provided that there is competition (Ariga & Inoue, 2015).

An important matter that I have not mentioned before, is that while scarcity did increase desirability, utility and attractiveness, it did not increase liking, or appreciation of the commodity after consumption (Worchel et al., 1975). For example, participants in the study by Worchel et al. (1975) reported that they found scarce cookies more attractive, desirable and costly, but did not report a better taste. Unfortunately, Ariga and Inoue (2015) only measured attractiveness of the cookies. It is important for marketers that consumers also like the commodity after having bought it in a scarcity promotion, because perceived quality of the brand increases brand loyalty via consumer satisfaction (Frank, Torrico, Enkawa, & Schvaneveldt, 2014). In turn, brand loyalty increases repurchase intention and decreases counterpersuasion from competitors (Dick & Basu, 1994). Therefore, it is important to have a closer look at the liking of a scarce commodity. It has been repeatedly shown that the effect of scarcity on value is stronger in a social situation, possibly because competition triggers one's need-for-uniqueness. However, Lynn (1991) mentioned in his meta-analysis on commodity theory literature that some studies report that sometimes the desire to avoid selfishness can dominate the scarcity effect. Therefore, in a social setting, self-presentation and guilt about one's selfishness towards other people with the same goal might also have an influence on the evaluation of a commodity.

Guilt and pleasure

Going back to the example in the introduction, commodity theory can explain why you find that last cupcake attractive. However, many people would be reluctant to give in to the temptation to eat it, since it would not be fair to have more of the commodity compared to others in the social environment. Research has shown that when dividing a shared resource, people often use the norm of equality, which states that resources should be divided equally to all members of a relevant group (Deutsch, 1975, as described by Diekmann, Samuels, Ross, & Bazerman, 1997). Transgressing this norm within a relevant group with which one identifies, might lead to feelings of guilt (Giguère, Lalonde, & Taylor, 2014).

Research suggests that unconscious emotions could still influence conscious evaluations of stimuli that are of the same emotional valence (Winkielman & Berridge, 2004). So it is possible that you think you are happy with getting a larger share of a commodity, while you unconsciously feel guilty about transgressing the fairness norm. The negative

emotion, guilt, causes you to feel negative about the commodity. Furthermore, Hofmann, Kotabe and Luhmann (2013) found that indulging to temptations leads to a "spoiled pleasure" effect, meaning that people's momentary happiness is lower after giving in to temptations than after giving in to nontemptations. A temptation is a desire that conflicts with one's self-regulatory goals, and is expected to involve only delayed and no immediate emotional costs. However, the results of this study indicated that temptations do involve immediate emotional costs that are a consequence of self-conscious emotions, such as guilt. Thus, the results of both studies suggest that feeling guilty about eating the last piece of a hedonic good results in a reduction of pleasure. Of course disliking a commodity would be an undesirable result of a scarcity promotion.

On the other hand, Goldsmith, Kim Cho, and Dhar (2012) found that feeling guilty can also have a positive outcome. In their studies, people reported higher rates of liking and higher willingness to pay for the unhealthy food they tasted after they were primed with guilt. Even when guilt was directly related to consumption by priming health goals, more pleasure from consumption was experienced. Furthermore, when guilt was not primed, but actually experienced, the effect of guilt on pleasure remained. In conclusion, experiencing guilt during or right before hedonic consumption can increase pleasure, since people have a learned unconscious cognitive link between guilt and pleasure, which was confirmed with an implicit measure.

According to Giner-Sorolla (2001), guilty pleasures arise when we perform short-term behaviour with positive consequences, although on the long term this behaviour has negative consequences. Goldsmith et al. (2012) proved that this is true for minor transgressions that do not affect others, such as consuming unhealthy food. However, it is not yet studied whether norm transgressions with an external source of guilt, such as claiming the last of a commodity, also lead to pleasurable guilt or that this source of guilt will interfere with pleasure. It would be interesting to see whether people who claim the last of a commodity find the product itself more attractive and desirable because of the scarcity effect, but also find consuming it less pleasurable and desirable because of the guilt they (unconsciously) experience from transgressing the equality norm. This research will examine whether combining the effects of scarcity and guilt in a social situation will increase or decrease both wanting and liking the commodity.

An important factor thus is whether people will feel guilty towards the competition for the scarce commodity. Moreover, some people might feel guiltier than others after norm transgressions. This might be dependent on people's social value orientation (Murphy &

Ackermann, 2014). According to this theory, a decision-maker has social preferences when it comes to joint outcomes, of which the following four are most common. People with an individualistic motivation are motivated to maximize the outcome for themselves, while in contrast people with an altruistic orientation are motivated to maximize the outcome of the other person. Furthermore, people with a competitive orientation are motivated to maximize the difference between their own outcomes and that of the other. Pro-socially oriented individuals are either motivated to minimize the difference between themselves and the other because they are averse to inequality, or to maximize the joint outcomes (Murphy & Ackermann, 2014). Based on this theory, it is expected that social value orientation moderates the effect of guilt on pleasure. Specifically, people with a pro-social or altruistic orientation will experience more guilt after transgressing the norm of equality than people with a competitive or individualistic orientation, and will evaluate the product more negatively.

This research contributes to prior literature in the following ways. Firstly, to my knowledge the combined effects of scarcity and guilt on consumption have never been investigated before. An implication could be that scarcity promotions are less effective if feelings of guilt are induced before consumption. Guilt could lead to the negative evaluation of the commodity, which will lead to lower customer satisfaction (Frank et al., 2014). In turn, lower customer satisfaction decreases loyalty and thus repurchase behaviour (Dick & Basu, 1994). Secondly, the effect of guilt on pleasure was demonstrated with personal norm transgressions (Goldsmith et al., 2012; Conzen, n.d.). Therefore, it is important to investigate whether the effect holds when guilt is a result of social norm transgressions. Furthermore, since a large part of the method of the third experiment by Ariga and Inoue (2015) will be used, their results can be replicated and thus will be more reliable.

To investigate the combined effects of scarcity and guilt on the evaluation of a commodity, we will have participants evaluate a hedonic product on both pleasurableness of consumption (taste) and attractiveness of the product and of consumption. There will be three conditions. In the control condition, the product will be abundant. In the scarcity condition, the product will decrease to only one piece, inducing scarcity. The social scarcity condition is the same as the scarcity condition, except that a second participant who is supposed to taste the same product will be present. By only changing the social factor between the two experimental conditions, we can compare them to investigate the effect of guilt on liking. Comparing the experimental conditions with the control condition, we can investigate the effect of scarcity on attractiveness of the good. Other factors that influence feelings of guilt and attractiveness or liking of the product, BMI and health goals, are accounted for.

Hypotheses

Based on the studies by Brock and Brannon (1992), Worchel et al. (1975) and Ariga and Inoue (2015), it is expected that in a situation where an abundant commodity rapidly becomes scarce, the commodity increases in attractiveness compared to a situation in which the commodity is abundant. As found in the study by Ariga and Inoue (2015), it is not the commodity of which are the fewest after reduction, but the commodity which has decreased that is evaluated as most attractive. Furthermore, both Worchel et al. (1975) and Ariga and Inoue (2015) found that competition is an important moderator for the scarcity effect. Therefore,

H1: A decrease of a commodity (scarcity condition) leads to an increase in attractiveness of that commodity and of consumption compared to a constant amount of a commodity (control condition).

H2: Scarcity in the presence of competition (social scarcity condition) leads to an increase in attractiveness of the commodity compared to a scarcity in the absence of competition (scarcity condition).

Furthermore, in the study by Worchel et al. (1975), no effect of the presence of others on taste of the cookies was found. However, there was enough of the commodity left for the other person, so it can be assumed that no guilt was experienced. It is expected that feelings of guilt are evoked when there is nothing of the good left after consumption, because the norm of equality is transgressed (Deutsch, 1975, as described by Diekmann et al., 1997; Giguère et al., 2014). The guilty feeling will decrease liking and attractiveness of consumption of the commodity (Winkielman & Berridge, 2004). In short,

H3: Experiencing scarcity in the presence of someone else (social scarcity condition) leads to feelings of guilt compared to scarcity in the absence of someone else (scarcity condition).

H4: Experiencing scarcity in the presence of someone else (social scarcity condition) leads to a reduction of liking and attractiveness of consumption compared to scarcity in the absence of someone else (scarcity condition).

However, based on social value orientation theory, it is expected that one's social value orientation moderates the effect of guilt on pleasure. Specifically, people with a pro-social or altruistic orientation will experience more guilt after transgressing the norm of equality than people with a competitive or individualistic orientation, and will evaluate the

product more negatively. Furthermore, people with a pro-social or altruistic orientation will report less desirability of consuming the scarce commodity than people with a competitive or individualistic orientation (Winkielman & Berridge, 2004). Thus,

H5: Driven by increased guilt, individuals with a pro-social or altruistic social value orientation will report less liking and attractiveness of consumption in the social scarcity condition compared to individuals with a competitive or individualistic social value orientation.

Method

Participants 222 participants have been recruited, of which most were first-year psychology students from Leiden University. They were randomly assigned to the three different conditions (55 in the control condition, 58 in the scarcity condition, and 90 in the social scarcity condition, of which 45 evaluated the scarce gumdrop). Data of participants who guessed the goal of the study correctly (n = 1) or who discontinued the study because they could not eat the type of food (n = 2) were not included in the analysis. Furthermore, some participants in the social scarcity condition shared the scarce gumdrop, and therefore their data were also excluded from the analysis (n = 16). This resulted in an analysis of data from 203 participants with an average age of 20.36 years (SD = 3.62), of which 162 were women. Participants received either €3,50 or 1 course credit after completing the study.

Stimuli In a pilot test, we searched for two types of candy that were perceived distinctively, to make it evident that one of the types was scarce in the experimental conditions. However, the two types had to be evaluated as equally attractive and tasty by the control group, so that we could see a clear difference between the two kinds after the experimental manipulation. Ariga and Inoue (2015) for example used dark chocolate and plain white cookies, which were found to be equally attractive. The pilot test has shown that different colours of gumdrops were perceived as distinct, but equally attractive and tasty. Since gumdrops are packaged in bags with different colours, we randomly picked two colours for every participant. An advantage of this was that any confounding effects regarding colour were minimized.

Design In this experiment there were three conditions, in which people tasted and evaluated two colours of gumdrops. In the scarcity condition, one of the colours recently became scarce (scarcity). In the combined scarcity and guilt condition, one of the colours recently became scarce and there was another participant present (social scarcity). In the control condition,

both colours of gumdrops were abundant and there was no other participant present. All participants first saw a jar with enough gumdrops of both colours, which was called the product example. Then, in the scarcity and social scarcity condition, the participants received a plate with gumdrops, but there was only one gumdrop of one of the colours. So in the jar this kind was abundant, while on the plate it was scarce. In the control condition, the plate contained enough gumdrops of both colours. The participant rated both colours on attractiveness and pleasurableness. The data from the participants who didn't receive the scarce gumdrop in the social scarcity condition were not included in the analyses. This set up resulted in a 3 (condition: control, scarcity, social scarcity) x 2 (commodity: scarce colour x abundant colour) between-participants design.

Instruments

Scarcity manipulation The setup of our experiment was very similar to the third experiment by Ariga and Inoue (2015). All participants were presented with a jar with 10 gumdrops of two different colours, for example 4 red and 6 yellow ones. This jar had been labelled with "Example" and it was only used to introduce the participant to the product. Before tasting, the experimenter removed the jar and presented the participant with a plate containing gumdrops. In the control condition, one participant received a plate that contained 4 red and 6 yellow gumdrops. In the scarcity condition, one participant received a plate with 4 red and 1 yellow gumdrops. In the social scarcity condition, two participants were in the same room and received one plate with 4 red and 1 yellow gumdrops. The experimenter explained that there were not enough yellow gumdrops left, so one of the participants could only evaluate the red gumdrops. Since only one of the participants could taste the yellow gumdrop, (s)he was expected to experience guilt towards the other participant. As in the study of Ariga and Inoue (2015), the participants were not allowed to talk to each other. This reduced the chance of the participants trying to share the scarce commodity or explaining away their guilt. A schematic illustration of the conditions can be found in Figure 1.

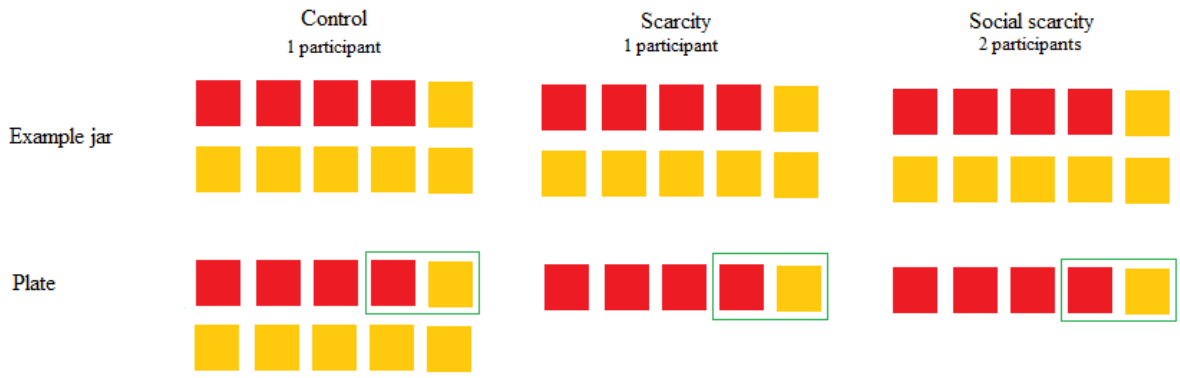

Figure 1: A schematic illustration of the conditions.

Taste Test. The participants evaluated the two colours one by one and thus were presented with the same questions twice. They were free to choose which colour gumdrop they tasted first. Two aspects of the gumdrops were measured. Firstly, before tasting, desirability (wanting) of the product was measured with the question "How attractive do you find the gumdrop?". After tasting, pleasurableness (liking) was measured with four questions, namely, "How tasty/sweet/fruity/delicious did you find the gumdrop?". Then, desirability of consumption was measured with two questions, specifically, "How likely is it that you are going to buy a bag with 100 grams of this colour gumdrops in the future?", and "How much are you willing to pay in eurocents for a bag with 100 grams of this colour gumdrops?" All questions were answered on a 7-point Likert scale from 1 (not at all) to 7 (very much), except the willingness to pay, which was an open-ended question. Additional questions about participants' current state and preference were asked, specifically, "Have you ever consumed this product before?", "How much do you enjoy eating this product in general?" (1 (not at all) to 7 (very much)), "How hungry were you during the taste test?" (1 (not at all) to 7 (very much)), and "How many hours ago did you last eat?" (Less than one hour ago, 1-2 hours ago, 3-4 hours ago, more than 4 hours ago).

Social Value Orientation (SVO). Murphy, Ackermann, and Handgraaf (2011) designed an improved measure of SVO, called the Social Value Orientation Slider Measure (test-retest reliability: $r = 0.915$). In this extended measure, participants are provided with fifteen scales on which different outcomes are depicted. Each outcome one could receive is connected to an outcome for the other. On each scale, the participant has to decide which outcome (s)he and the other will receive, indicating one's social preference.

Manipulation Check. Several checks were necessary for this research. First of all, it needed to be tested whether the manipulation worked. Therefore, participants were asked in separate questions to identify the amount of both colours of gumdrops in the jar and on the plate. Then they were asked two separate questions about how guilty they felt after tasting both colours. These questions were answered on a Likert scale from 1 (not at all) to 7 (very much). Furthermore, we checked participants' health goals with the questions "How often do you think about obtaining or maintaining a healthy weight?" and "How often do you think about a healthy diet?" that were answered on a Likert scale from 1 (never) to 7 (a lot). Moreover, participants' age, gender, height and weight were assessed to calculate their BMI. Lastly, participants were asked to guess the goal of the research and whether they noticed anything remarkable in two open-ended questions.

Procedure The participants were invited to the lab. First, the participant read and agreed to the informed consent. Secondly, (s)he completed the Social Value Orientation Slider Measure on the computer and then proceeded to do a filler task about food preferences. When the participant finished the first study, (s)he proceeded with the Taste Test. The participant heard that a large candy manufacturer instructed the experimenters to have people evaluate their product for market research. Each participant was randomly assigned to one of the conditions: the scarcity condition, the social scarcity condition, or the control condition. After tasting the product, the participant evaluated both colours with the questions of the Taste Test. After completing the manipulation check, (s)he was debriefed, thanked and paid.

Results

Manipulation Check

In all conditions, people noticed that one colour was abundant on the plate, while there was only one of the other colour. However, many participants could not tell exactly how many of each colour there were in the jar. In the control condition, people should have noticed that the amount of gumdrops had stayed the same, while in the scarcity conditions people should have noticed that the number of one colour of gumdrops had been reduced from the jar to the plate. Except for one participant, who was excluded from the analysis, everyone indeed reported that the scarce colour on the plate was abundant in the jar. Most of the time participants guessed the abundant number in the jar as one more or less than the actual number and therefore it can be assumed that they did not perceive the abundant colour gumdrop as scarce.

Reliability of the Taste Test

A reliability analysis confirmed that the four items of the Liking subscale of the Taste Test are coherent, with a Cronbach's $\alpha = 0.96$. The inter-item correlations ranged from 0.83 to 0.97.

Confounding variables

According to Sartor et al. (2011), BMI is related to taste perception. Moreover, the amount of hunger and how much people usually enjoy the product can influence taste perception as well (Jacobson, Green & Murphy, 2010). Furthermore, people's current health goals were hypothesized to influence the amount of guilt experienced after consumption (Goldsmith et al., 2012) and therefore also influence liking and attractiveness of the product (Winkielman & Berridge, 2004). It is important to control for these effects, so as not to attribute their effects to scarcity and/or guilt. Therefore, standardized BMI, hunger, general enjoyment, and health goals were initially included as covariates in every statistical analysis, and excluded if they were not significant. A MANOVA with condition as the independent variable and standardized BMI, hunger, general enjoyment, and health goals as dependent variables proved that there are no significant differences between conditions, Pillai's Trace = 0.06, $F(12, 582) = 1.05$, $p = 0.40$. However, their effects will not be thoroughly discussed, because they are not relevant for our particular research questions.

Data analyses

Every hypothesis was tested with repeated measures ANCOVAs. First of all, the third hypothesis was tested to check whether our manipulation worked, with condition as the between-subjects variable and guilt after eating the scarce and the abundant gumdrop as the within-subjects variable.

Secondly, four repeated measures ANCOVAs were conducted to investigate hypothesis 1, 2 and 4. Condition was the between-subjects variable, and either attractiveness, liking (tastiness, sweetness, fruitiness, deliciousness), purchase intentions or willingness to pay for the scarce and the abundant colour of gumdrops was the within-subjects variable. As mentioned before, all significant covariates were included in the analyses.

To answer the fifth hypothesis, first a repeated measures ANCOVA was conducted with guilt after eating the scarce or abundant gumdrop as within-subjects variable, and SVO and condition as between-participants factors, to investigate whether the different SVO types experienced more or less guilt. Secondly, the four aforementioned ANCOVAs were repeated with SVO as a second between-subjects variable.

Guilt after consumption of a scarce product

It was expected that people would experience guilt if they had to taste a colour gumdrop of which there was not enough for both participants (Hypothesis 3). Only the scarcity conditions were included in this analysis, since only those participants ate a scarce gumdrop as well as an abundant gumdrop. Health goals appeared to be a significant covariate, $F(1, 100) = 6.87$, $p = 0.01$. So when people were concerned about a healthy diet and maintaining a healthy weight, they felt guiltier after eating the gumdrops than when they were not. The results of the analysis indicated a marginally significant interaction effect of scarcity and condition, $F(1, 100) = 3.48$, $p = 0.07$, $\eta^2 = 0.03$. When the gumdrop was scarce, people experienced more guilt in the social scarcity condition than in the non-social scarcity condition, $M_{\text{social-scarcity}} = 2.43$ and $M_{\text{scarcity}} = 2.06$. When there was enough of the colour gumdrops, the participants did not differ in experienced guilt, $M_{\text{social-scarcity}} = 1.91$ and $M_{\text{scarcity}} = 1.95$. Furthermore, the main effect of the amount of gumdrops was significant, $F(1, 99) = 8.25$, $p = 0.005$. The amount of guilt after consuming a scarce gumdrop was higher than after consuming an abundant gumdrop, $M_{\text{scarce}} = 2.23$ and $M_{\text{abundant}} = 1.91$. Condition was not significant, $F(1, 99) = 0.24$, $p = 0.62$.

The effect of scarcity and competition on product attractiveness

It was expected that the participants in the scarcity condition would report increased attractiveness of the product compared to participants in the control condition (Hypothesis 1). Furthermore, it was hypothesized that the presence of competition in the social scarcity condition would lead to an even larger increase in product attractiveness of the product compared to the scarcity condition (Hypothesis 2). Since there was no scarce gumdrop in the control condition, the evaluations of both gumdrops in this condition were substituted with the mean of the evaluation of both gumdrops.

The results of the analysis indicated that hunger positively predicted attractiveness of the product ($F(1, 153) = 8.12$, $p = 0.005$), and that there was a significant interaction effect between condition and attractiveness of the scarce and abundant gumdrops when controlled for hunger, $F(2, 153) = 6.28$, $p = 0.002$, $\eta^2 = 0.08$. The means indicated that when a certain colour gumdrop was abundant, it was evaluated as more attractive in the scarcity conditions ($M_{scarcity} = 4.45$ and $M_{social\text{-}scarcity} = 4.82$) than in the control condition ($M_{\text{control}} = 4.10$). Moreover, when a certain colour gumdrop was scarce, it was evaluated as more attractive in the scarcity condition than in the control condition ($M_{\text{control}} = 4.08$ and $M_{scarcity} = 4.99$).

However, the means also suggested that the scarce gumdrop was evaluated as less attractive in the social scarcity condition than in the scarcity condition, $M_{social\text{-}scarcity} = 4.44$. So while it was expected that competition would lead to an increased scarcity effect, the opposite happened. Therefore, the second hypothesis was rejected.

The effect of competition on product liking

We have seen that people in the social scarcity condition experienced more guilt after eating the scarce gumdrop than people in the scarcity condition (Hypothesis 3), suggesting that the presence of competition leads to guilt. It was hypothesized that this guilty feeling would reduce liking of the product, expressed in tastiness, fruitiness, sweetness and deliciousness, as well as attractiveness of consumption, expressed in willingness to pay and purchase intentions (Hypothesis 4).

The results revealed that hunger and general enjoyment significantly influenced liking of the product, $F(1, 152) = 4.47$, $p = 0.04$ and $F(1, 152) = 9.75$, $p = 0.002$, respectively. So the gumdrops were appreciated more if participants were hungry and liked the product more in general. Levene's Test for homogeneity of variances was significant for sweetness of the abundant gumdrop, however, the ANCOVA was robust because the group sizes are approximately equal ($n_{max}/n_{min} = 1.31$). The results of the analysis indicated that there was a significant interaction effect between condition and liking of the scarce and abundant gumdrop when controlled for hunger and general enjoyment, $F(2, 152) = 3.40$, $p = 0.04$, $\eta^2 = 0.04$. The ratings of the abundant colour barely differed between conditions, $M_{control} = 4.97$, $M_{scarcity} = 5.00$, and $M_{social\text{-}scarcity} = 4.99$. However, the ratings of the scarce colour were higher in the scarcity condition compared to the control condition ($M_{scarcity} = 5.13$ and $M_{control} = 4.95$), and, as expected, much lower in the social scarcity condition compared to the control condition, $M_{social\text{-}scarcity} = 4.71$.

The effect of scarcity and competition on attractiveness of consumption

The second part of the first hypothesis stated that the participants in the scarcity condition would also report increased attractiveness of consumption, indicated by participants' willingness to pay and their purchase intentions, compared to participants in the control condition. Moreover, the guilty feeling resulting from competition (Hypothesis 3) was expected to have a negative influence on attractiveness of consumption (Hypothesis 4). The analysis of purchase intentions indicated positive relations with the covariates hunger ($F(1, 153) = 6.79$, $p = 0.01$) and general enjoyment ($F(1, 153) = 7.05$, $p = 0.009$). So people are

more likely to buy the product in the future when they are hungry and when they have always liked the product. Furthermore, neither an interaction effect of purchase intentions of the scarce and abundant gumdrop and condition was found ($F(2, 153) = 1.55$, $p = 0.22$), nor a difference between the three conditions ($F(2, 153) = 1.10$, $p = 0.34$), nor a difference between scarcity and abundance ($F(1, 153) = 1.49$, $p = 0.23$).

The analysis of willingness to pay indicated a positive effect of general enjoyment ($F(1, 142) = 4.14$, $p = 0.04$). Furthermore, a significant main effect of condition was found, $F(2, 142) = 3.33$, $p = 0.04$, $\eta^2 = 0.04$. The social scarcity condition differed from the control condition ($M_{\text{control}} = 82.14$ and $M_{\textit{social-scarcity}} = 102.88$, $p = 0.02$), and from the scarcity condition ($M_{\text{scarcity}} = 85.89$, $p = 0.05$). The means suggested that people wanted to pay more for a bag of 100 grams of gumdrops in the social scarcity condition compared to the other conditions. So, the effect of guilt on willingness to pay was the opposite of what was expected. There was no significant interaction effect of scarcity and condition, $F(2, 142) = 0.72$, $p = 0.49$.

The influence of SVO on guilt

Lastly, it was expected that people with a prosocial or altruistic social orientation value (SVO) would experience more guilt than people with a competitive or individualistic SVO, and therefore that SVO moderates the relationship between guilt and pleasure (Hypothesis 5). To investigate this hypothesis, participants' "SVO angle" had to be calculated from the six primary SVO items, and then the angles were transformed to the four SVO categories. The SVO of the first eighteen participants could not be obtained, because of technical difficulties on the first day in the lab. Of the 185 other participants, 2 were competitive (1.1%), 28 were individualistic (15.1%) and 155 were prosocial (83.8%). None of the participants was altruistic. In the analysis, the data of the individualists and competitors were combined because the groups were small. Henceforth they will be called the "pro-selves". Of all participants, 22 pro-selves and 120 pro-socials evaluated a scarce gumdrop.

First, it was investigated whether different SVO types experienced more or less guilt. The analysis conveyed that health goals significantly influenced guilt, $F(1, 86) = 6.24$, $p = 0.01$. So both SVO types experienced more guilt when they were concerned about a healthy diet or weight. Neither the interaction effects, nor the main effect of condition ($F(1, 86) = 0.95$, $p = 0.33$), nor that of SVO ($F(1, 86) = 0.96$, $p = 0.33$) was significant. However, there was a main effect of scarcity, $F(1, 86) = 4.23$, $p = 0.04$, $\eta^2 = 0.05$. So both the pro-socials and the pro-selves reported higher amounts of guilt when the colour of the gumdrop was scarce

(M_{scarce} = 2.13) than when it was abundant ($M_{abundant}$ = 1.77) in both scarcity conditions, while it was expected that the pro-socials would experience more guilt than the pro-selves in the social scarcity condition.

SVO and the effect of competition on product liking

It was expected that pro-social individuals would report less liking and attractiveness of consumption in the social scarcity condition than individuals with a pro-self SVO, because they would feel guiltier towards the competition when they ate the scarce gumdrop (Hypothesis 5).

The repeated measures ANOVA indicated that there was no effect of SVO, $F(1, 133) = 0.005$, $p = 0.94$. Thus, pro-socials and pro-selves did not differ in their evaluations of tastiness, sweetness, fruitiness and deliciousness of the abundant and scarce gumdrops.

SVO and the effects of scarcity and competition on attractiveness of consumption

When attractiveness of consumption was investigated, results indicated that there was no difference between the different SVO types or conditions for future purchase intentions when controlled for general enjoyment ($F(1, 133) = 9.93$, $p = 0.002$).

For the analysis of willingness to pay, Levene's Test for homogeneity of variances was significant for the abundant gumdrop. However, the ANCOVA was robust because the group sizes are approximately equal (n_{max}/n_{min} = 1.18). The results indicated that there was a significant main effect of SVO, $F(1, 122) = 3.95$, $p = 0.05$, $\eta^2 = 0.03$. Irrespective of the condition and of the amount of gumdrops, pro-socials were willing to pay more for the product than pro-selves, $M_{pro\text{-}social}$ = 93.67 and $M_{pro\text{-}self}$ = 73.77.

SVO and the effects of scarcity and competition on product attractiveness

It was not expected that feelings of guilt after taking a scarce product at the expense of competition would influence the effect of scarcity on product attractiveness, because guilt would influence the evaluation only after taking the scarce gumdrop, while attractiveness of the product was measured before tasting. Therefore, there were no expectations in advance on the influence of SVO on attractiveness of the product. However, when attractiveness of the scarce and abundant gumdrop were analysed, a significant interaction effect between condition and SVO was found ($F(2, 132) = 3.90$, $p = 0.02$, $\eta^2 = 0.06$) when controlled for hunger ($F(1, 132) = 8.60$, $p = 0.04$). The means indicated that both pro-socials and pro-selves found the scarce gumdrop more attractive in the scarcity condition ($M_{pro\text{-}social}$ = 4.85 and $M_{pro\text{-}}$

$_{self}$ = 4.09) than in the control condition ($M_{pro\text{-}social}$ = 4.26 and $M_{pro\text{-}self}$ = 3.73). However, the pro-selves evaluated the scarce gumdrop as even more attractive in the social scarcity condition ($M_{pro\text{-}self}$ = 5.33), while the pro-socials reported the scarce gumdrops as less attractive when they were the only one to taste it ($M_{pro\text{-}social}$ = 4.48).

Discussion

The goal of this research was to examine whether combining the effects of scarcity and guilt in a social situation would increase or decrease both the attractiveness and liking of a commodity. Based on commodity theory, it was expected that people would find a product and consuming that product more attractive when it is scarce than when it is abundant (Brock & Brannon, 1992). Moreover, it was expected that the presence of someone else who has the same goal, a competitor, would increase the desirability of the scarce product even more (Worchel et al., 1975; Ariga & Inoue, 2015). Secondly, based on Giguère et al. (2014), it was hypothesized that taking the last of a product at the expense of someone else would lead to strong feelings of guilt, because the norm of equality would be transgressed. Winkielman and Berridge (2004) found that emotions can unconsciously influence evaluations of stimuli. Therefore, guilt, a strong negative emotion, was expected to lead to a negative evaluation of the scarce product, even though some people might be unaware of their guilty feelings. In particular, participants who experience scarcity in a social situation should like the product and consuming it less.

To answer these questions, participants evaluated a scarce and an abundant colour of gumdrops in one of three different conditions. Participants in the scarcity conditions received one gumdrop of one colour, and four gumdrops of another colour. In the social scarcity condition there was another participant present. Therefore, only one of the participants in this condition could evaluate both the scarce and the abundant gumdrop, while the other only evaluated the abundant gumdrop. The evaluations of the participants who rated a scarce colour of gumdrops were compared to the evaluations of participants in the control condition, who received enough gumdrops of both colours.

The results indicated that people indeed rate gumdrops as more attractive in the scarcity condition than in the control condition, so the scarcity effect was replicated (Brock & Brannon, 1992). An unexpected result is that there was also a small scarcity effect for the abundant colour. Participants reported that they didn't pay much attention to the jar, so it could be that they only knew that there were more gumdrops in the jar than on the plate. Therefore, a possible explanation for this effect is that participants also perceived scarcity for

the abundant colour, but less strong than for the scarce colour. This could be further examined by developing a new procedure in which participants have to pay more attention to the initial amount of the product. Another explanation could be that the positive evaluation of one gumdrop carried over to the evaluation of the second gumdrop: the halo effect (Thorndike, 1920).

Furthermore, while it was expected that the presence of competition would lead to an increase in attractiveness of a scarce product (Worchel et al., 1975; Ariga & Inoue, 2015), in this study it actually leads to a decrease compared to the abundant gumdrop. This is remarkable, because our study was quite comparable to that of Ariga and Inoue. However, in their study, participants had to take turns, and the first one was appointed by the experimenter (the "participant" waiting for his turn was a confederate). In our study, both participants had to taste at the same time, and so they were not able to attribute taking the last of a product to an external cause (the experimenter). Therefore, they probably expected to feel guiltier about claiming the scarce gumdrop. According to Goldsmith et al. (2012), people think that the pleasure of hedonic consumption will decrease if they expect to feel guilty about it. It is probable that competition did not lead to enhanced attractiveness of the scarce product in our experiment, because participants expected to feel guilty about taking the last gumdrop of a certain colour. To investigate this further, future research could compare a non-social scarcity situation to these two situations of scarcity in a social situation: one where the experimenter appoints the participant who tastes the scarce product, and one where the participants have to decide mutually who will taste the scarce product. For the first social situation, the attractiveness rating should be higher than in the non-social scarcity situation, while ratings in the second social situation should be lower than in the non-social scarcity situation.

In line with this reasoning, we did hypothesize that the presence of competition would lead to less liking during actual consumption. We did not expect the same effect for product attractiveness, because guilt would only influence individual's evaluation after claiming the scarce product. When competition for a scarce product is present, we see that people indeed like the scarce product less, because they take it at the expense of someone else. A likely explanation is that not being able to share in a fair way leads to guilt, which in turn spoils the pleasure of hedonic consumption. Another interesting finding is that people like the abundant colour gumdrops more when there is someone else present who also tastes the gumdrop. According to research by Boothby, Clark, and Bargh (2014), experiences are amplified when they are shared with someone else. A plausible explanation for our finding is that the abundant colour gumdrop was liked more because both participants tasted it at the same place

at the same time. Thus, in a social situation, a product is liked less when it is scarce, and liked more when it is abundant.

Furthermore, it was expected that guilt towards competition would also negatively influence people's willingness to pay for the scarce colour of gumdrops, because guilt has a negative influence on the consumption experience. However, it seems that people were actually willing to pay more in the social condition. The amplifying theory by Boothby et al. (2014) could also apply to willingness to pay for the abundant gumdrop. Because again, as we have seen for attractiveness of the product, participants wanted to pay more for both the scarce and the abundant gumdrop. Another possibility is that people want to get rid of their guilty feeling and therefore compensate their negative behaviour with an altruistic action: paying more for the scarce product (Regan, 1971).

While the scarcity effect was found for attractiveness of the product before consumption, it was not for attractiveness of consuming the product again in the future. So after consumption, participants didn't differ in purchase intentions and willingness to pay for the product. What is notable, is that the overall means for pleasurableness and desirability of the gumdrops are not extremely favourable; participants were quite neutral towards the product. This could be a reason that people are not interested in buying the product for themselves. This is a limitation of our study. When people are initially more attracted to the product type and find it more pleasurable, they are probably more disappointed when they can't consume it. The disappointment could trigger more intense guilt in the individual who did consume the scarce product. Therefore, they will like and desire the product less than usual. Specifically, the difference between the ratings of people in the control condition and the social scarcity condition would be more contrastive. Future research should examine whether purchase intentions are higher when the product is more appreciated in general.

It is important to mention that overall, people reported that they did not experience much guilt. Though people in the social scarcity condition reported more guilt than people in the scarcity condition, their mean was around 2 on a 7-point scale. An explanation is that participants linked the question about guilt more to unhealthy consumption and health goals than to guilt towards another person. Another explanation could be that they did not want to admit their guilt, and therefore adjusted their response downward. This is a disadvantage of self-reporting measures. A solution could be to use an implicit measure in future research, such as the Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998) with the categories me/others and guilt/justified. Looking at the results, it is possible to assume that participants did experience guilt towards the other.

In summary, when a product is scarce, people find it more attractive and find its consumption more pleasurable than when the product is abundant. However, participants indicate that they are not more likely to buy it in the future or to pay more for the product. Furthermore, when a scarce product is evaluated in a social situation, people find the product less attractive and less pleasurable than in a non-social situation. They are not more likely to buy it, but they are willing to pay more for it. The results for scarcity in a non-social situation are thus in contrast with scarcity in a social situation. The mechanism that is proposed to cause this contrast, is experienced guilt after consuming a product at the expense of someone else. At the end of the article Goldsmith et al. (2012) wrote about guilty pleasures, they suggested that the boundaries of their findings should be investigated. In particular, does the effect of guilt on pleasure hold with a different source of guilt? This research indicates that transgressing a social norm, in contrast to a personal norm, reverses the positive effect of guilt on experienced pleasure.

Finally, it was investigated whether someone's social value orientation (Murphy & Ackerman, 2014) moderates the effects of scarcity and guilt on desirability of consumption and liking of the product. Specifically, it was expected that people with a pro-social preference for joint outcomes would experience more guilt after transgressing the fairness norm and therefore report less appreciation of the product compared to people with a pro-self orientation. The findings are only exploratory, because there were very few pro-selves and no altruists in our sample and no effect of SVO on liking was found. However, although there were no established hypotheses about this variable, SVO did moderate the scarcity effect on product attractiveness. Specifically, pro-selves showed the enhanced scarcity effect when there was competition present, while pro-socials showed the opposite pattern, namely that reported attractiveness of the product decreased when the participant claimed the last piece of a resource.

According to Murphy and Ackerman (2014), pro-social people are averse to unequal distribution. As a result, they are more likely to experience guilt (Giguère et al., 2014). Therefore, competition amplifies the scarcity effect for pro-selves, but diminishes it for pro-socials. According to Van Lange, Otten, De Bruin, and Joireman (1997), who compared the distribution of SVO in a sample representative of the Dutch adult population to two other SVO studies, there are more pro-socials than pro-selves. Specifically, in the age group 15-29, in which most of our participants fell, 55.9% has a prosocial SVO, 30.7% has an individualistic SVO and 13.3% a competitive SVO (N = 2278). In the present study, the ratio shows the same pattern: the percentages are 83.8%, 15.1% and 1.1% respectively (N = 185).

This study suggests that scarcity promotions are a risky strategy when people realize that they consume the product at the expense of others, because guilt may come into play. An implication is that marketers should be reserved to use scarcity appeals when there are other consumers present.

Another effect of SVO that was found in this study, is that pro-socials want to pay more for the gumdrops than pro-selves, regardless of amount and condition. A simple explanation is that pro-socials think more about others' well-being (Van Lange, Bekkers, Schuyt, & Van Vugt, 2007) and therefore want to make a fair deal compared to pro-selves. Future research should examine whether this effect holds in a larger sample which includes more pro-selves in each condition, and whether there are applicable consequences of this effect.

People are usually reluctant to take the last piece of hedonic food, as shown by the behaviour of some of the participants. A few couples in the social condition for example shared the gumdrop, although we told them not to, and one couple even refused to eat the scarce gumdrop. It seems there is a good reason why some countries even have a characteristic word for the last piece. For example, the Dutch/Flemish word is "schaambrokje", freely translated to "morsel of shame" (http://www.encyclo.nl). It would be interesting to examine in a field study to what extent people are tempted to consume the morsel of shame and how much they really enjoy it if they give in to this temptation.

In conclusion, the current research has demonstrated that (expected) guilt can negatively influence the attractiveness and pleasurableness of a scarce hedonic product. While the scarcity effect was replicated, the moderating effect of competition was not. Competition only enhanced the scarcity effect for people with a pro-self social value orientation whereas it did not for people with a pro-social orientation. Another finding is that experiencing guilt about a scarce product makes people willing to spend more on it. Thus, when you share cupcakes with a group, they are attractive until there is only one left. Expecting to feel guilty about taking the last one makes it less attractive to consume it, and when you do, you enjoy it less. Hence, I'd like to warn marketers who consider scarcity promotions and individuals who consider taking the last of a product: less is not always more!

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